

IN THE CLAIMS:

Please amend the claims as shown below. After amendment, the status of the claims will be as follows.

Claims 1 - 61 (cancelled)

62. (currently amended) A clamping apparatus comprising:  
a frame;

four clamping arms pivotably mounted on the frame for pivoting with respect to the frame with a single degree of freedom and positioned on the frame so as to be able to grasp a rectangular load from four sides of the load, each clamping arm including a contact portion for contacting a load to be lifted, each clamping arm defining a four-bar linkage which controls an angle of the contact portion with respect to the vertical as the clamping arm pivots with respect to the frame; and

a plurality of drive mechanisms connected to the clamping arms to pivot the clamping arms with respect to the frame.

63. (previously presented) A clamping apparatus as claimed in claim 62 wherein the four-bar linkage comprises a parallel linkage which maintains the angle of the contact portion with respect to the vertical constant as the clamping arm pivots with respect to the frame.

64. (currently amended) A clamping apparatus as claimed in

claim 62 wherein the four-bar linkage of each clamping arm includes a lever portion pivotably connected to the frame and to the contact portion of the clamping arm, and a rigid control rod for adjusting the angle of the contact portion with respect to the vertical extending alongside the lever portion and having an upper end pivotable with respect to the frame and a lower end pivotable with respect to the contact portion.

Claims 65 - 74 (cancelled)

75. (previously presented) A clamping apparatus as claimed in claim 64 wherein the control rod has an adjustable length.

76. (previously presented) A clamping apparatus as claimed in claim 75 wherein the length of the control rod can be adjusted by rotating a body of the control rod.

Claims 77 - 82 (cancelled)

83. (currently amended) A clamping apparatus comprising:  
a frame;

a plurality of clamping arms pivotably mounted on the frame, each clamping arm including a lever portion pivotably mounted on the frame, a contact portion for contacting a load to be lifted pivotably mounted on the lever portion, and ~~an~~ a rigid adjustable-length rod extending alongside the lever portion and having a lower end pivotable with respect to the contact portion,

a change in the length of the rod changing an angle of the contact portion with respect to the lever portion; and

at least one drive mechanism connected to one of the lever portions to pivot the lever portion with respect to the frame.

Claim 84 (cancelled)

85. (previously presented) A method of using a clamping apparatus comprising grasping a rectangular layer of items disposed on a pallet from four sides with the clamping apparatus of claim 96 and lifting the layer off the pallet.

Claims 86 - 89 (cancelled)

90. (previously presented) A method of using a clamping apparatus comprising grasping a rectangular layer of items disposed on a pallet from four sides of the layer with the clamping apparatus of claim 62 and lifting the layer off the pallet.

91. (previously presented) A method as claimed in claim 90 wherein the layer comprises a layer of boxes of food, and each contact portion has a surface which contacts a side of the layer and is approximately parallel to the side of the layer.

92. (previously presented) A method as claimed in claim 90 wherein the layer comprises cans of beverages, and each contact

portion has a surface which contacts a side of the layer and is sloped downwards towards the side of the layer at an angle of 2 - 6° with respect to the side of the layer.

93. (previously presented) A clamping apparatus as claimed in claim 62 wherein each contact portion has a substantially planar surface for contacting a side surface of a load extending between an upper and a lower edge of the contact portion.

94. (currently amended) A clamping apparatus as claimed in claim 64, wherein:

the lever portion is pivotably supported by the frame for pivoting with a single degree of freedom about a pivot point which is fixed with respect to the frame;

the control rod ~~is portion~~ is pivotably supported by the frame for pivoting with a single degree of freedom about a pivot point which is fixed with respect to the frame; and

the contact portion includes an elongated rigid panel having a surface for opposing a load to be lifted and a plurality of mounting lugs secured to the panel and pivotably connected to a lower end of the lever portion and a lower end of the control rod.

95. (currently amended) A clamping apparatus for grasping a rectangular layer of items disposed on a pallet comprising:

a frame;

a pair of opposing clamping arms pivotably mounted on the

frame for pivoting with respect to the frame with a single degree of freedom, each clamping arm including a contact portion pivotably disposed at a lower end of the clamping arm for contacting a side surface of a rectangular layer of items, the contact portion having an upper edge, a lower edge, and a substantially planar contact surface extending between the upper and lower edges for contact with a side surface of a layer of items, the contact portions of the opposing arms being capable of being spaced from each other by at least 28 inches to enable the clamping apparatus to grasp a layer measuring at least 28 inches on a side, each clamping arm defining a four-bar linkage which controls an angle of the contact portion with respect to the vertical as the clamping arm pivots with respect to the frame; and

at least one drive mechanism connected to one of the clamping arms to pivot the one of the clamping arms with respect to the frame.

96. (currently amended) A clamping apparatus for lifting a rectangular load from a pallet comprising:

a frame;

two pairs of opposing clamping arms pivotably mounted on the frame for pivotting with respect to the frame with a single degree of freedom and positioned on the frame so as to be able to grasp a rectangular load from four sides of the load, each clamping arm including a contact portion for contacting a load to be lifted, and

a plurality of drive mechanisms connected to the clamping arms to pivot the clamping arms with respect to the frame,

wherein for each pair of clamping arms, a separation between the contact portions of the clamping arms of the pair can be made at least 28 inches and can change by at least 4 inches due to pivoting of at least one of the clamping arms of the pair relative to the frame with an angle with respect to the vertical of each contact portion of the pair changing by no more than 2 degrees when the contact portions of the pair are not contacting a load.

97. (previously presented) A clamping apparatus as claimed in claim 96 wherein for each pair of clamping arms, a separation between the contact portions of the clamping arms of the pair can change by at least 4 inches due to pivoting of at least one of the clamping arms of the pair relative to the frame with an angle with respect to the vertical of each contact portion of the pair changing by no more than 1 degree when the contact portions of the pair are not contacting a load.

98. (previously presented) A clamping apparatus as claimed in claim 96 wherein for each pair of clamping arms, a separation between the contact portions of the clamping arms of the pair can change by at least 4 inches due to pivoting of at least one of the clamping arms of the pair relative to the frame with an angle with respect to the vertical of each contact portion of the pair changing by no more than 0.5 degrees when the contact portions of

the pair are not contacting a load.

99. (previously presented) A clamping apparatus as claimed in claim 96 wherein for each pair of clamping arms, a separation between the contact portions of the clamping arms of the pair can change by at least 8 inches due to pivoting of at least one of the clamping arms of the pair relative to the frame with an angle with respect to the vertical of each contact portion of the pair changing by no more than 2 degrees when the contact portions of the pair are not contacting a load.

100. (previously presented) A clamping apparatus as claimed in claim 96 wherein for each pair of clamping arms, a separation between the contact portions of the clamping arms of the pair can change by at least 10 inches due to pivoting of at least one of the clamping arms of the pair relative to the frame with an angle with respect to the vertical of each contact portion of the pair changing by no more than 2 degrees when the contact portions of the pair are not contacting a load.

101. (previously presented) A clamping apparatus as claimed in claim 96 wherein the angle with respect to the vertical of the contact portion of any of the clamping arms varies by at most 2 degrees as a lower end of the contact portion travels by a horizontal distance of at least 6 inches as the clamping arm pivots with respect to the frame when the contact portion is not contacting a load.

102. (previously presented) A clamping apparatus as claimed in claim 96 wherein the angle with respect to the vertical of the contact portion of any of the clamping arms varies by at most 2 degrees as a lower end of the contact portion travels by a horizontal distance of at least 8 inches as the clamping arm pivots with respect to the frame when the contact portion is not contacting a load.